USACE Takes Going Green to New Heights

By Dr. JoAnne Castagna

It's been called the new centerpiece of the city of Alexandria, Virginia. It is the new multistory Department of Defense (DOD) administrative office complex. The facility is not only the tallest structure in the region but also the tallest building ever erected by the United States Army Corps of Engineers (USACE).

LEED Certification

What isn't as obvious as the size of the building is something that may be more impressive. This is the first project of this size where the Corps is working for Leadership in Energy and Environmental Design (LEED) Gold building certification and the only one in the region that will save 30 percent of the energy of a traditional complex—and save taxpayers millions.

LEED is an internationally recognized green building certification system that was developed by the United States Green Building Council. There are different levels of certification, based on the number of points earned; LEED Gold is one of the top certifications, earning 60–79 points. Other certifications are Certified (40–49 points); Silver—the minimum level to be achieved for federal buildings

Photo by Marc Barnes, U.S. Army Corps of Engineers

Precast exterior wall panels are quickly rising to the top of 17-story and 15-story office towers as construction continues on the Department of Defense office complex at the Mark Center in Alexandria, Virginia.

Photo by Marc Barnes, U.S. Army Corps of Engineers

A contractor applies materials to seal the exterior wall of the south parking garage at the Department of Defense office complex (BRAC 133) project site.

(50–59 points); and Platinum (80–100 points). The rating system is centered around prerequisites, credits, and points per credit—with credits based on possible environmental impacts and human benefits.

In March 2009, the USACE New York District began constructing the design-build complex located at the Mark Center in Alexandria, in partnership with Duke Realty Corporation and Clark Construction. The complex will be home to multiple DOD agencies that are currently occupying leased space throughout the National Capital Region and will also include the Washington Headquarters Services, the base realignment and closure (BRAC) executive agent for these DOD customers. The project—which when completed in September 2011 will become a part of Fort Belvoir, Virginia—implements the 2005 BRAC Commission Recommendation Number 133.

The new 1.7-million-square-foot facility sits on a 16-acre campus and, when construction is completed, will consist of two towers (15-story and 17-story), two parking garages, a visitor center, remote inspection facility, and a public transportation center that will service the Mark Center and surrounding community. The city of Alexandria and other team members stressed the importance of making this complex certified LEED Gold, and USACE made this its mission.

According to the chief of the BRAC 133 Project, the goal was to have two certifications for the complex—LEED Silver and LEED Gold. After a review of the original design plans showed that only one point separated the project from being certified LEED Gold overall, the chief decided to shoot for LEED Gold for the entire complex. To obtain that level, USACE is designing and constructing the complex using cutting-edge strategies to earn LEED credits.

Energy-Saving Features

The following features are estimated to save 30 percent on energy needed for the LEED complex:

Indoor Lighting

The team is taking measures to ensure that all of the DOD personnel will have adequate, yet energy-saving, lighting. The entire complex will have light-emitting diode (LED) and fluorescent lighting that will cost a little more to purchase up front, but will reap tremendous savings down the road. This type of lighting requires less electricity to run, and LED and fluorescent light bulbs last longer than typical bulbs—up to eight years! Lighting use will be conserved with the help of room occupancy sensors that will automatically turn lights on and off, depending on whether a room is being occupied.

Natural lighting will also be used to the fullest. The complex is being constructed with large, shatterproof windows that will allow an abundance of outside light into the building. To help distribute this light, work stations in the complex will be built with low cubicle partitions to make sure there is adequate light spreading throughout the building.

Indoor Air Quality

Low cubicle partitions will facilitate air circulation, thereby improving air quality, which is also a goal of the team. The complex will have an energy-efficient central air system that will keep indoor air comfortable year-round for the personnel. To conserve this air, large windows in the complex will be highly insulated to prevent air from leaking outside the building. Since fresh outside air is necessary for healthful indoor air quality, a system will be put in place for personnel to allow outdoor air into the building without wasting considerable energy.

The team is constructing "green roofs" on the Visitors' Center and Remote Inspection Facility in the complex. These rooftops with vegetation on them are not only esthetically pleasing but also hold in warm indoor air during winter and keep building interiors cool during the warmer months. Another way the team is keeping indoor air

Photo by Marc Barnes, U.S. Army Corps of Engineers

The USACE New York District is managing design and construction of the $1.08 billion facility as part of BRAC 2005.

comfortable on some structures is by installing special rooftops that will reflect sunlight away from the buildings, keeping indoor air cool during the warmer months.

Indoor air toxins are also a threat to air quality, and the team is taking measures to minimize this issue. One way is by using paints, carpets, and wooden furniture that emit lower levels of toxic fumes. After the structures are painted and carpeted and contain their furniture, the team will air out the structures before DOD personnel occupy the space. In addition, DOD has agreed to use low-toxin cleaning products inside the building after the occupants move in.

Water Efficiency

The complex will use nearly 50 percent less water than a traditional building of the same size—a savings of 4.5 million gallons of drinking water annually. To accomplish this, low-flow faucets, urinals, and showerheads will be used inside the complex. Outside the complex, there will be no landscape irrigation; only drought-tolerant native plants will be planted. The team is also constructing a bioswale—a ditch that catches rainwater and slows the water runoff from the site, capturing sediment and contaminants before they go into the storm drains—outside most of the main structures.

Recycling

When the project is completed, it is estimated that 6 million pounds—or 75 percent—of construction waste will be recycled and not placed in disposal sites. The team is also recycling some of the trees that they had to remove to construct the complex, taking the wood to create wall paneling for some of the complex's interior. Recycling will continue once residents are in the building; they will be provided a 500-square-foot recycling area in their loading dock with recycling bins that will also be stationed on each floor of the towers.

Transportation

The DOD agencies occupying the complex will encourage their employees to take alternate ways in commuting that will save energy and reduce pollution. The agencies are doing this by providing special parking for van pools, carpools, and fuel-efficient hybrid vehicles in the complex's two parking garages and by supplying 300 bicycle racks and showers for bicyclists. The complex will also have its own mass transit center with access to the Metro Bus, Dash Bus, and DOD shuttle services.

Summary

The BRAC 133 Project is an incredible mission for the New York District. As the standards for green building are slowly being worked out, they are going to get better, and USACE is helping to lead the way in moving them forward.

Dr. JoAnne Castagna is a technical writer-editor for the United States Army Corps of Engineers, New York District, and can be reached at <joanne.castagna@usace.army.mil>.